PM1100 SERIES

USER MANUAL

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LIMITED WARRANTY

This product is manufactured to exacting standards and the manufacturer warranties that should any defect in materials or workmanship occur within the warranty period then it will be repaired or, at the manufacturer's discretion, replaced, free of any charge for labour or materials. This warranty applies when the equipment has been used in accordance with the instructions and does not cover failure due to operator error or use outside design limits.

The manufacturer assumes no responsibility for editorial errors or omissions and for consequential losses and/or damages. The information in this document is subject to change without notice.

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GENERAL SAFETY POINTS

This equipment has been designed and tested to meet strict international safety requirements, attention to the following general guidelines will ensure it's continued safe operation.

Always connect mains equipment to a properly grounded power socket. The socket must conform to I.E.C. publication 364 "Electrical Installation of Buildings", or the equivalent national standard for example "15th Edition of I.E.E. Wiring Regulations" in the United Kingdom. If in doubt have the power socket checked by a qualified electrician.

For protection against electric shock, certain parts of equipment, including the interface connections, are designed such that the voltage is limited to a safe value. In order to maintain this protection it is essential that any equipment connected to the printer has interface connections that are similarly protected.

It is recommended that assurance is obtained from manufacturers / suppliers of such equipment that interfaces comply with the requirements of PELV circuits in accordance with BS7002 or SELV circuits in accordance with I.E.C. 435 edition 2.

In some cases where equipment is supplied with a moulded mains plug which is not compatible with local sockets the moulded plug should be cut off and destroyed. **MOULDED MAINS PLUGS WHICH HAVE BEEN CUT OFF ARE POTENTIALLY DANGEROUS AND MUST BE DESTROYED.**

Unless equipment is designed to be used without an earth, e.g. battery powered or double insulated equipment, the equipment must be earthed.

Always exercise care in moving/positioning equipment.

Always site equipment on a surface suitable for it's weight.

Always use the correct consumables (e.g. paper and ribbons). Use of incorrect consumables will invalidate the warranty and may result in degraded performance/reduced equipment life.

Do not remove plates, covers or guards that are secured in place by screws or clips. There are no user serviceable areas within such covers and their removal will invalidate the warranty and may pose a safety risk.

Do not override or defeat mechanical or electrical interlock devices.

Do not allow hair, jewellery or clothing to hang into the equipment (particularly whilst changing consumables) since this poses a serious safety risk.

Do not operate the equipment if unusual smells or noises are noticed. Turn the equipment off and contact your supplier for advice.

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INTRODUCTION

This manual applies to all models of the PM1100 series. Throughout this document the term PM1100 is used generically, any model specific variations are explicitly stated.

General Description

The PM1100 is a compact panel mounted printer available with either serial or Centronics parallel interfaces. The PM1100 offers the following features

- **M** Easy paper load/ribbon replacement.
- **M** Serial RS232/TTL or Centronics Parallel options.
- **M** International Character set.
- **M** User selectable options stored in non-volatile RAM.
- **M** Head jam protection - power to the print head and carriage motor is switched off in the event of a head jam to prevent damage.
- **M** Full 96 ASCII character set (plus additional European and scientific characters).
- **M** One line buffer.
- **M** Double width printing.
- **M** Double height printing.
- **M** Underlining.
- **M** Built-in tab stops.
- **M** Vertical tab.
- **M** Form feed.
- **M** Self-test facility.
- **M** Inverted Printing. (Data Mode)
- **M** Graphics.
- **M** Reset command.
- **M** Software diagnostics.
- **M** Epson ESC/POS and Citizen 560 Emulations.
- **M** Reverse Print.

A more detailed feature/specification list is contained in Appendix D.

PM1100 Variants

The PM1100 is available in a number of variants the principle difference between them being the mechanism fitted as detailed below:-

PM1101 - M160 Mech - 24 Cols @ 0.7 lines/second.

PM1102 - M163 Mech - 32 Cols @ 0.5 lines/second.

PM1103 - M164 Mech - 40 Cols @ 0.4 lines/second.

PM1106 - M180 Mech - 24 Cols @ 1.7 lines/second.

PM1107 - M181 Mech - 30 Cols @ 1.3 lines/second.

PM1108 - M182 Mech - 36 Cols @ 1.1 lines/second.

PM1109 - M183 Mech - 42 Cols @ 1.0 lines/second.

PM1112 - M190 Mech - 24 Cols @ 2.5 lines/second.

PM1114 - M192 Mech - 40 Cols @ 1.7 lines/second.

Additionally the model number indicates the type of data interface as follows:-

PM11XX.5100	Serial (RS232 and TTL) interface
PM11XX.5400	Centronics parallel interface

INSTALLATION AND OPERATORS GUIDE

General

The PM1100 is designed to be panel mounted as illustrated in **Figure 1**. The printer should be positioned so as to provide easy access to the feed and programme switch and to the paper well when the lid is open. It is recommended that the PM1100 is not sited in an excessively hot or humid location. Exposure to grease, dust, metal swarf or liquids is best avoided.

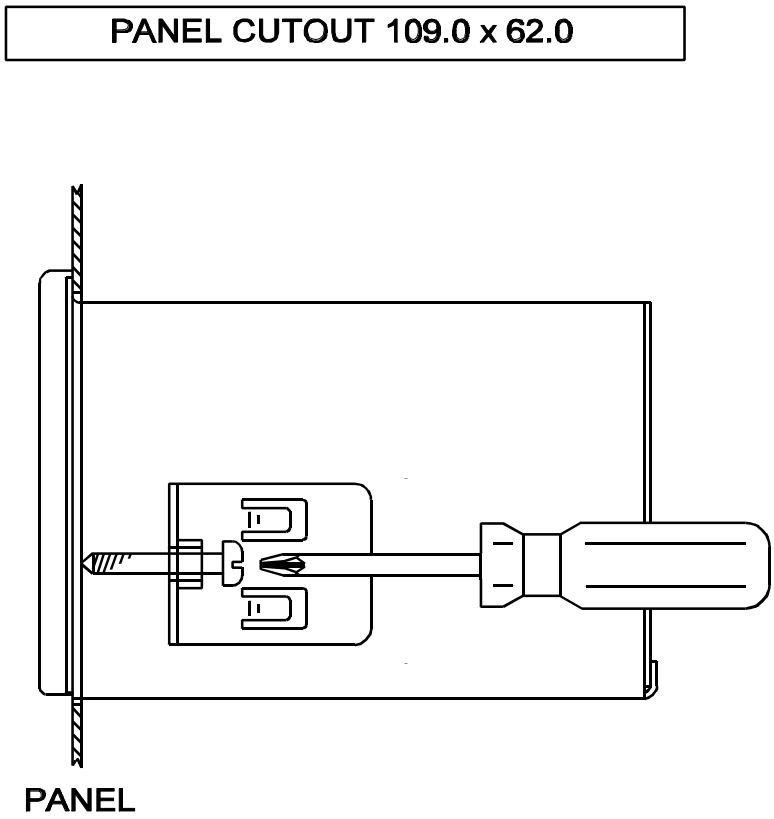


Figure 1

PM1100 Panel Mounting

PM1100 Connector and Switch Details

Power and data are supplied via a single 16 way header located on the rear of the printer as shown in **Figure 2**. Each printer is supplied with a connector with short flying leads suitable for mating with this header. Please note that conventional IDC ribbon cable and connectors are not generally considered suitable for connection to a PM1100.

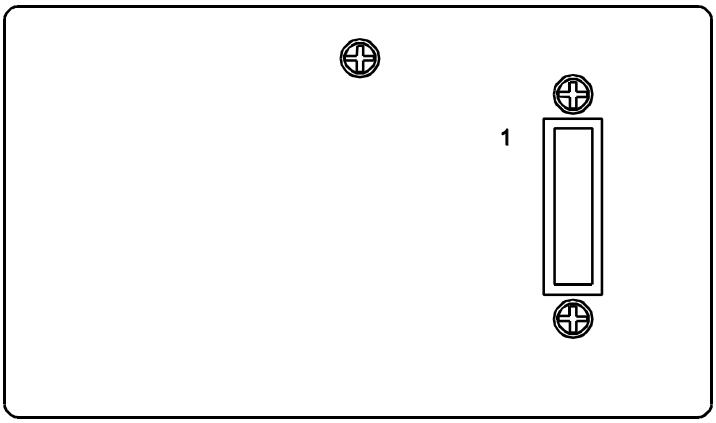


Figure 2

PM1100 Connector Location

The PM1100 switch panel is shown in **Figure 3**. Full access to the switches is obtained by rotating the lid latch as illustrated in **Figure 4**. It should be noted that the paper feed switch is accessible even with the printer cover closed.

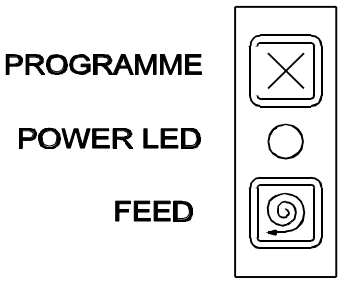


Figure 3

PM1100 Switches

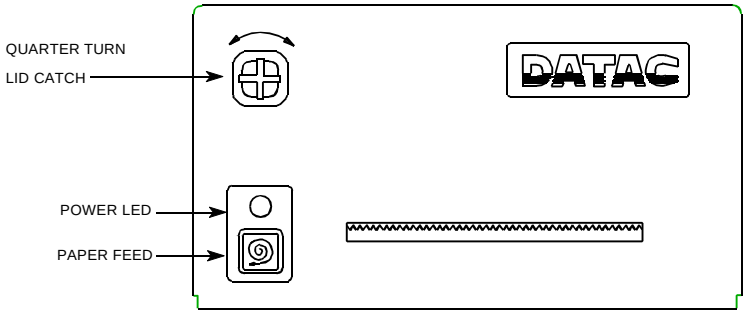


Figure 4

PM1100 Front Panel

Switches

Programme	:	Press and hold whilst powering on to enter programme mode. Once in programme mode press to cycle through the options for the selected parameter. When all parameters are set, press simultaneously with paper feed to exit programme mode.
Feed	:	Press and hold whilst powering on to initiate self test. When powered on, press to feed paper. When in programme mode press to select next parameter.
Indicators		
Green	:	When steady indicates PM1100 on. When flashing indicates printer in programme mode.

Power Supply

The PM1100 provides for two separate supply inputs, one for the electronics and one for the mechanism. Peak mechanism requirement may reach a momentary maximum of 24A so it is strongly recommended that separate supplies are employed for the mechanism and electronics to prevent noise spikes affecting the logic. If however the same 5V supply is used to feed the electronics and the mechanism, then peak mechanism current demands may cause the supply voltage to dip below the permitted level for the electronics. If this happens the protection circuit within the PM1100 will operate to prevent mechanism damage. Under these circumstances the printer may stop and restart repeatedly. This type of supply problem can normally be resolved by fitting a reservoir capacitor of around 3300µF on the 5V supply as close as possible to the PM1100. A typical suitable supply circuit is shown in Appendix C.

The PM1100 does not have an integral power switch and it is recommended that in order to ensure safety and ease of operation a power isolating switch is fitted. Generally such a switch is best mounted on the panel next to the printer to facilitate ease of self-test and programme/setup operations.

Paper Loading

The following procedure is recommended for replacing the paper roll. Open the lid to remove any remaining old paper. Do not to pull the paper backwards out of the rear of the mechanism. Press the feed switch until any excess paper left in the mechanism is fed out. Reel off a few centimetres from a new paper roll and ensure that the paper end is square.

Sit the paper roll in the paper well with the paper end coming from the bottom of the roll. Offer the paper into the back of the mechanism and press the feed switch. Keep the switch depressed until enough paper is fed out for insertion through the paper exit slot. Feed the paper through the exit slot and close the lid. **Figure 5** shows the paper path through the printer.

Ribbon Replacement

The recommended procedure for replacement of the printer ribbon is as follows (please refer to **Figure 6**). Open the lid and note that the legend on the cassette gives an instruction (PUSH) to remove the old ribbon. The cassette will clip off one side and can easily be removed. Take a new ribbon and check it is taut. Clip it into position making sure that the paper protruding from the top of the mechanism is located between the exposed ribbon and the plastic cassette. Wind the knob a few turns in the direction shown on the cassette to take up any slack in the ribbon. Close the lid.

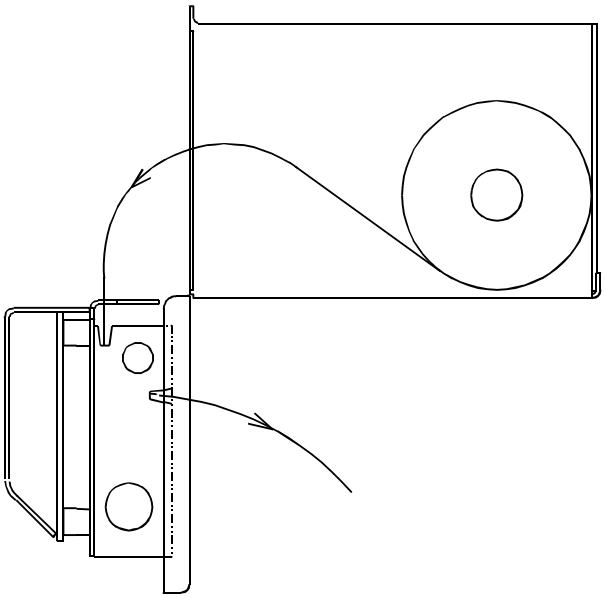


Figure 5

Paper Path

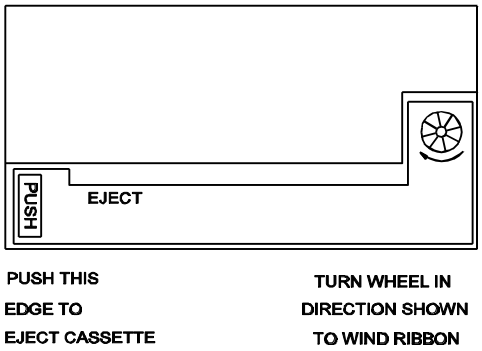
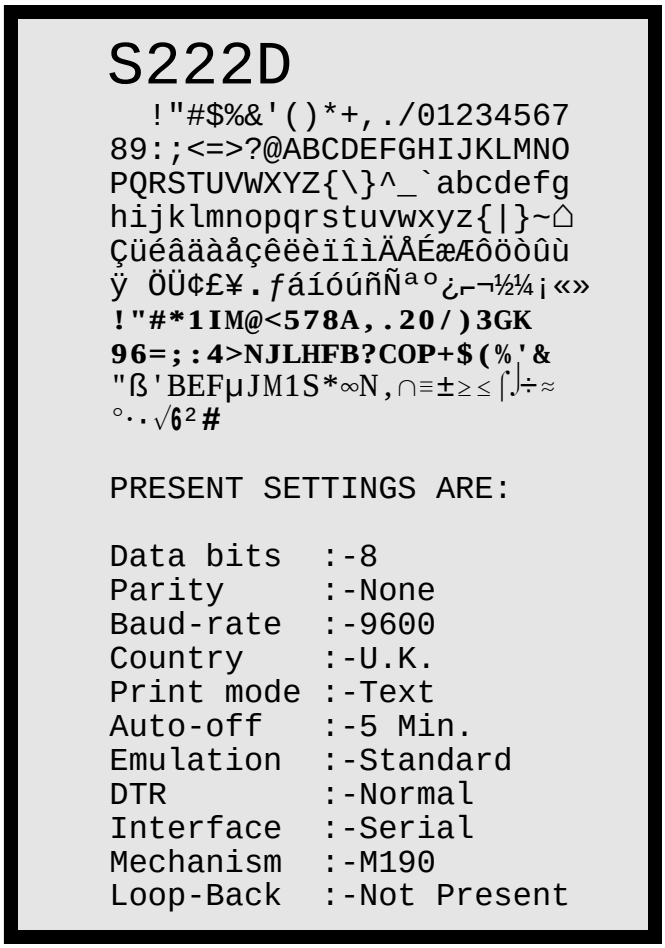


Figure 6

Ribbon Replacement

Self Test

To perform a self-test switch on the power to the printer at the same time as pressing the feed switch and keep the feed switch depressed until the test starts. This will check the mechanism and a large proportion of the software and hardware (except that dealing with the data interface) without the need for connection to a host. An example of a typical self-test pattern is shown overpage. The software issue is printed in double height, double width text, followed by the character set in normal text. Below this are listed the current settings of the user selectable options. If the settings are correct for your host, you are ready to connect the printer to your system. Otherwise you will need to reprogram the printer as described below. The self test will be repeated until the power is switched off. Normal operation is resumed after power on.



Loopback Test

On serial versions of the PM1100, when a self test is initiated the board checks to see if the CTS and DTR lines are looped together. If they are not, then the PM1100 prints "LoopBack :- Not Present" at the end of the parameters listing. If the PM1100 detects that CTS and DTR are connected, the DTR line is toggled and this is looked for at the CTS. If the toggling is correctly detected then "CTS/DTR :- PASSED" is printed. If there are errors "CTS/DTR :-FAILED" is printed.

If this test is completed the PM1100 checks for a link between RX and TX and attempts to send a short ASCII string over the link. If the ASCII string is successfully received the EM1100 prints "RX/TX :- PASSED". Otherwise it prints "RX/TX :- FAILED".

This test provides a means for checking the connection of the PM1100 to external equipment by verifying the operation of the line drivers/receivers used on the data interface.

Diagnostic Mode

Diagnostic Mode reveals control codes and characters sent to the printer. Characters 00H to 1FH are translated to characters 40H to 5FH and underlined to indicate a control character. To enter diagnostic mode initiate self-test and keep the feed switch depressed until 'DIAGNOSTIC MODE' is printed following one complete self test cycle. The power-on indicator will flash every two seconds whilst in this mode.

An example of diagnostic mode is as follows :

ABC DE F ...Normal Print

ABCIDE FM ...Diagnostic Print Out

In the example the following sequence of characters was sent:

Characters ABC, horizontal tab (I), characters DE, space, character F, carriage return (M).

A list of valid control characters is shown on page 11.

To terminate diagnostic mode switch off and power- on again to resume normal operation.

Default Settings

The PM1100 printer is supplied with the following default settings:

Data bits	8
Parity	None (Not shown for Parallel Interface)
Baud Rate	9600 (Not shown for Parallel Interface)
Character Set	UK
Print Mode	Text
Auto-Off	Not Applicable for Panel Mount
Emulation	Standard
DTR	Normal
Interface	Serial or Parallel
Mechanism	As applicable (Automatically detected and set by the printer)

Programme/Setup Mode

On the front of the unit there is a power on indicator and a paper feed switch. Opening the lid will reveal the programme switch situated next to the feed switch.

If the programme (set-up) switch is pressed at power up (i.e. programme switch and power-on switch together) then the printer will go into set-up mode and print the current parameter status. Example : Number of data bits : 8 bit data.

The power-on indicator will flash every second to indicate programme mode.

Each time the feed switch is pressed and released the next printer parameter is printed. Pressing the programme switch will cause the status of that parameter to change in the sequence shown. Each status table rotates so 300 baud follows on from 19200 baud and so on.

Once the correct status has been selected then both the programme switch and the feed switch should be pressed simultaneously to update the printer's status. Note that this need only be done when all parameters that need changing have been selected. If no switches are pressed for 15 seconds the set-up mode is automatically terminated without changing the original parameters.

Parameter (FEED Switch)		Status (PROGRAMME Switch)
(1)	Number of data bits	8 bit data 7 bit data
(2) *	Serial Parity	No parity Odd parity Even parity
(3) *	Serial Baud Rate	300 baud 600 baud 1200 baud 2400 baud 4800 baud 9600 baud 19200 baud
(4)	Character Set	USA ITALY FRANCE SPAIN G E R M A N Y JAPAN ENGLAND NORWAY DENMARK I DENMARK II SWEDEN
(5)	Print Mode	TEXT (Normal Print) DATA (Inverted Print)
(6)	Auto POWER OFF	5 minutes 1 minute Disabled
(7)	Emulation	Standard Citizen 560 ESC/POS
(8)	DTR	Normal Inverted

***** **NOTE : Not printed for a parallel interface**

An alternative method is to send the "set up" data via the RS232 port to prevent the need for manual programming.

Setup via Data Interface

If the PM1100 is turned on whilst both the programme and feed switches are pressed and only the programme switch is released, the PM1100 will print:-

"NVR COMMS READY>"

At this point the printer is waiting to receive data in the following format:-

"PROGRAMME-MODE" + CARRIAGE RETURN + n1 + ...n10 (n1 to n10 are hex numbers)

The "PROGRAMME-MODE" followed by a carriage return indicates that the printer should expect parameter data as shown in Table 1 below.

Note: The data sent to reprogramme the printer is always expected at 9600 baud, 8 data bits, no parity, irrespective of any of the existing printer settings.

Upon receiving information in the correct format the PM1100 will print:-

"DATA OK, NVR UPDATED!"

If the data received is not in the correct format then the PM1100 will print:-

"DATA ERROR NVR UNCHANGED"

Note: If no data is received within 15 seconds or the feed key is released before the procedure is complete, then the change of parameters will not take place and the PM1100 will print:-

"SET ERROR NVR UNCHANGED"

TABLE 1

n	Value → Description ↓	0	1	2	3	4	5	6	7	8	9	10
1	Data Bits	7	8									
2	Parity	Even	Odd	None								
3	Baud Rate	19200	9600	4800	2400	1200	600	300				
4	Country	Denmark 2	Norway	Japan	Spain	Italy	Sweden	Denmark 1	U.K.	Germany	France	U.S.A.
5	Print Mode	Data	Text									
6	Auto Off	Disabled	1 Minute	5 Minute								
7	Emulation	ESCPOS	560	Standard								
8	DTR	Inverted	Normal									
9	Zero Status	O	∅									
10	Reserved for future use - A zero value must be sent with present firmware											

String "PROGRAMME-MODE", 0DH,n_1,n_2,n_3,n_4,n_5,n_6,n_7,n_8,n_9,n_{10}

SAMPLE PROGRAMME IN BASIC

```
10      KEY OFF:CLS:
15      LOCATE 2,25:PRINT "NVR TEST ROUTINE FOR PM1100";
16      LOCATE 3,25:PRINT "-------------------------";
20      LOCATE 5,25:INPUT "(S)erial or (P)arallel ?",A$
30      IF A$="S" OR A$= "s" THEN 60
40      IF A$="P" OR A$= "p" THEN 50
45      GOTO 10
50      WIDTH "lpt1:",255:OPEN "lpt1:" AS #1:GOTO 65
60      OPEN "COM1:9600,N,8,1,RS,CSO,DS65535" AS #1
65      LOCATE 7,5:INPUT "Press prog+feed, power on, release prog on PM1100, then
        press
        any key ...";B$
70      PRINT #1,"PROGRAMME-MODE";CHR$(13);
80      FOR I=1 TO 10:READ A:PRINT #1,CHR$(A);:NEXT I
90      RESTORE
100     PRINT #1,CHR$(13);CHR$(13)
110     CLOSE #1
120     DATA 0,1,2,9,0,1,1,1,1,0
```

The programme sets: 7 data, odd parity, 4800 baud, France, Data mode, 1 min., 560, NORMAL DTR, zero with a "slash" across it.

Note that the factory defaults can always be restored by pressing both the feed and programme switches at power up then releasing only the Feed switch. Defaults will be restored and a printed message acknowledges that this has occurred.

PROGRAMMING

Command Summaries

Standard Mode

Function	Keystroke	Hex	Decimal
Horizontal Tab	CTRL I	09H	9
Line Feed	CTRL J	0AH	10
Form Feed	CTRL K	0BH	11
Vertical Tab	CTRL L, n	0CH, n	12,n
Carriage Return	CTRL M	0DH	13
Double Width	CTRL N	0EH	14
Single Width	CTRL O	0FH	15
Reset	CTRL Q	11H	17
Underline	CTRL U	15H	21
Underline Release	CTRL X	18H	24
Reverse Print	CTRL Y	19H	25
Double Height	CTRL Z	1AH	26
Graphics	CTRL [, n	1BH, n	2 7 , n

Epson ESC/POS Emulation

Function	Keystroke	Hex	Decimal
Horizontal Tab	CTRL I	09H	9
Line Feed	CTRL J	0AH	10
Form Feed	CTRL L	0CH	12
Carriage Return	CTRL M	0DH	13
Set Print Mode	ESC ! n	1BH, 21H, n	27,33,n
Initialise Printer	ESC @	1BH, 40H	27,64
Character Set	ESC R n	1BH, 52H, n	27,82,n
Print & Feed	ESC d n	1BH, 64H, n	27,100,n
Status Request	ESC v	1BH, 76H	27,118
Inverted Printing	ESC { n	1BH, 7BH, n	27,123,n
Set form length	ESC C n	1BH, 43H, n	27,67,n

Citizen 560 Emulation

Function	Keystroke	Hex	Decimal
Line Feed	CTRL J	0AH	10
Form Feed	CTRL L	0CH	12
Carriage Return	CTRL M	0DH	13
Reverse Print	CTRL T	14H	20
Clear Buffer	CTRL X	18H	24
Graphic Print	ESC K	1BH, 4BH	27,75
Page length/format acknowledged	ESC C	1BH, 43H	2 7 , 6 7
Paging Is Off	ESC O	1BH, 4FH	27,79
2.75 mm Spacing	ESC 1	1BH, 31H	27,49
5.5 mm Spacing	ESC 2	1BH, 32H	27,50
Double Width	-	1EH	30

but not executed.

Single Width	-	1FH	31

Command Details

Standard Mode

TAB (09H)	Tab stops occur at every 8th column. On receipt of this command, spaces are entered into the line up to the next tap stop.
LINE FEED (0AH)	Prints current line and feeds one line. If LF, CR is sent, the CR is ignored to avoid a double feed.
FORM FEED (0BH)	Will feed 4 fast line feeds.
VERTICAL TAB (0CH,n)	Fast feeds the paper by n lines. n is a single byte hex number in the range 0 < n < 20H. Note that a vertical tab will print the contents of the line buffer before being executed.
CR (0DH)	Prints current line and feeds one line. If CR and LF is sent the LF is ignored to avoid a double feed. On the receipt of the last printable character (e.g. 24 characters for M190), the printer will automatically print the data in the buffer. If CR and LF are sent after this condition they will be ignored.
DOUBLE WIDTH (0EH)	Turns double width printing on. This state continues until terminated by the single width command or completion of the current line. If the last character in the line buffer is double width but there is only room for a single width character, then it will be printed in single width.
SINGLE WIDTH (0FH)	Reverts to single width printing. Single and double width can be combined anywhere on a line.
RESET (11H)	Causes printer status reset. Printer status is set to single width, normal height, no underline. Note that the buffer remains unaltered to avoid any data loss.
UNDERLINE (15H)	Characters sent after this command will be underlined. Tabs are not underlined. Underlining is terminated by the U/L release command or on completion of the current line.
U/L RELEASE (18H)	Terminates underlining.
REVERSE PRINT(19H)	This command sets the print to white on black. The command will toggle between reverse and normal print

wherever it appears on a line but the condition is always reset at the end of the line.

DOUBLE HEIGHT (1AH) — Prints the line in double height for one line only. Double height and single height cannot be mixed on the same line.

GRAPHICS (1BH,n) — Graphics command to enter bit image printing. The number of graphic bytes sent will depend on the type of mech. (e.g. 24 for M190, 40 for M192). For each graphic byte sent, 6 bits out of the 8 bits are used to build the graphics string (LSB as the right most dot). 'n' is the number of times the string sent will be repeated for a repetitive pattern. 'n' is limited to a maximum of 255 lines. The print buffer will be printed first if not empty.

Examples:

To repeat a string of data bytes, d1....d24 over two rows for an M190 mechanism send : 1BH, 02H, d1....d24.

For a non-repeated string send : 1BH, 01H, d1....d24.

Epson ESC/POS Emulation

TAB (09H) — Tab stops occur at every 8th column. On receipt of this command, spaces are entered into the line up to the next tap stop.

LINE FEED (0AH) — Prints the current line and feeds one line. If LF,CR is sent the CR is ignored to avoid a double feed.

FORM FEED (0CH) — Prints the current line and feeds the number of lines determined by using the ESC C command.

CR (0DH) — Prints current line and feeds one line. If CR and LF are sent the LF is ignored to avoid a double feed.

ESC ! n (1BH,21H,n) — Sets the print mode according to the following table. n is a single byte in which each bit sets the printing function. Note that underlines cannot be used with a horizontal tab and any combination of double height and width can be used. Default is n = 0.

Bit	Function	Value	
		0	1
0	Character font	5 x 7 font	5 x 7 font
1	Undefined		
2	Undefined		
3	Undefined		
4	Double-height	Cancelled	Set
5	Double-width	Cancelled	Set
6	Undefined		
7	Underline	Cancelled	Set

ESC@(1BH,40H) Initialise printer. Clears the print buffer and resets the printer mode to default values.

ESC R n (1BH,52H,n) Selects international character set from the following table determined by the value of n. The default value is the character set programmed in the printer.

n	Country
0	U.S.A.
1	France
2	Germany
3	U.K.
4	Denmark 1
5	Sweden
6	Italy
7	Spain
8	Japan
9	Norway
10	Denmark 11

ESC d n (1B,64H,n) Prints the data in the print buffer and performs n line feeds.

ESC v (1BH,76H) Status request. The current printer status is transmitted to the host computer on receipt of this command. It takes the form of a single byte which is fixed at 0 (to indicate paper in). The byte is sent regardless of the CTS handshaking signal.

ESC { n (1BH,7BH,n) Inverted print command. When n = 1 then print is inverted and text will be printed from right to left. For normal print n = 0. The default mode is set by the programmed parameters in the printer.

ESC C n (1BH,43H,n) Set form length. When used in conjunction with the form feed command (0CH), the printer will feed n lines. Note that if n = 0 then there will be no line feeds.

Citzen 560 Emulation

LINE FEED (0AH) Feeds a new line after printing.

FORM FEED (0CH)	Carries out a form feed performance after printing. This function is fixed to three lines.
CR (0DH)	Feeds a new line after printing.
REVERSE PRINT (14H)	This command sets the print to white on black. The command will toggle between reverse and normal print wherever it appears on a line but the condition is always reset at the end of the line.
CLEAR BUFFER (18H)	Clears the print data in the buffer. All the previous input data is cleared with this code. However, in case of graphic print mode, this code is treated as data.
DOUBLE WIDTH (1EH)	Enhanced character designation. The designation is released with US code (1FH) or line feed (0AH). Standard and enhanced characters can be printed in one line.
SINGLE WIDTH (1FH)	Standard character designation. Initiated after power up and after each printed line.
ESC K n1, n2, (1BH,4BH n1, n2)	This command requires special note because all associated data will be ignored. The number of graphics bytes determined by n1 and n2, will be received but discarded so as not to appear as erroneous text.

Programming / Operation Notes

Operation

DO read the operating instructions carefully before you attempt to use the printer.

DO ensure that any electrical connections are properly made in accordance with the instructions.

DO NOT remove any fixed covers unless you are qualified to do so - and even then switch off first and disconnect the power adaptor from the socket before you start.

DO NOT continue to operate the printer if you have any doubt about it working normally, or if it is damaged in any way. Refer the unit for repair.

Power-On Procedure

Check that the power applied to the unit is correct.

Open the lid and check that paper and ribbon are present and that there are no foreign objects inside the paper well or mechanism.

Close the lid, ensuring the paper is guided out through the paper exit slot.

Switch on the power to the printer.

The power-on indicator will light, the mechanism head will briefly shuttle from side to side and the interface busy signal will clear. If this does not happen refer to Appendix E.

NOTE : There is no power on/off switch on the printer.

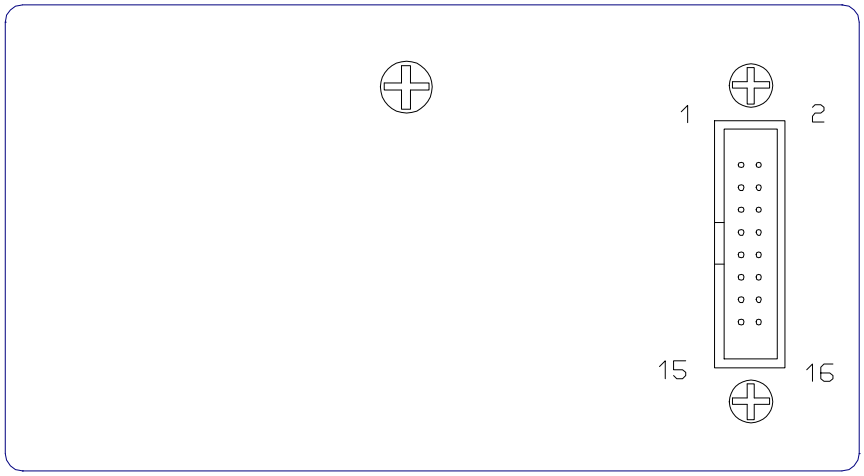
General

Do not remove paper by pulling it from the back of the mechanism and do not pull excessive lengths through the top of the mechanism. Either of these operations may cause paper to tear and jam the mechanism.

APPENDIX A

Connector and Timing Details

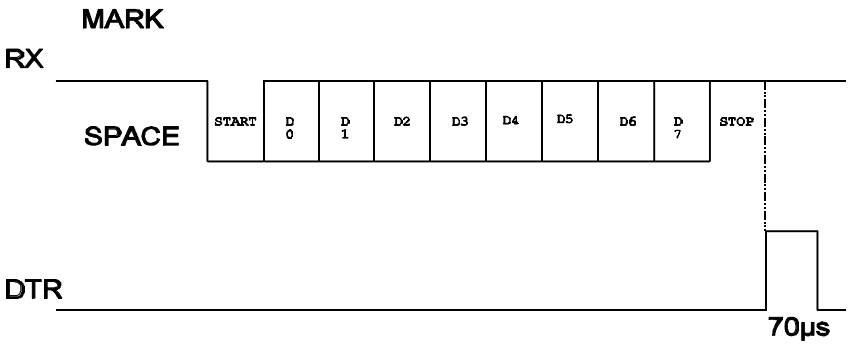
CONNECTOR AND TIMING DETAILS



PM1100 Connector Details

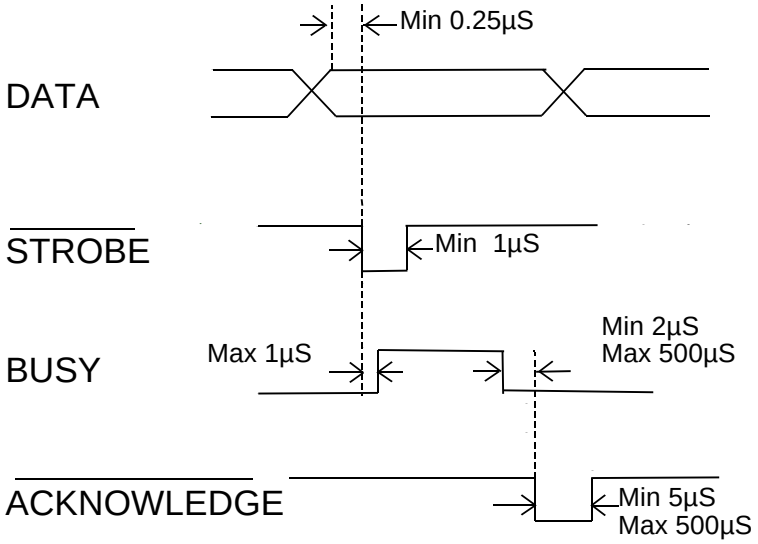
	Serial Connection Details
1	
2	DTR
3	
4	
5	
6	MECHANISM GROUND
7	
8	ELECTRONICS GROUND
9	
10	MECHANISM SUPPLY
11	
12	ELECTRONICS SUPPLY
13	
14	
15	
16	RECEIVED DATA

	Parallel Connection Details
1	DATA 7
2	BUSY
3	DATA 6
4	ACK *
5	DATA 5
6	MECHANISM GROUND
7	DATA 4
8	ELECTRONICS GROUND
9	DATA 3
10	MECHANISM SUPPLY
11	DATA 2
12	ELECTRONICS SUPPLY
13	DATA 1
14	
15	DATA 0
16	STROBE *



PM1100 Serial Data Timing

Note : Mark Voltage level is +5V for TTL data and <-5V for RS232 Data



PM1100 Parallel Data Timing

APPENDIX B

Character Set Details

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			SP	0	@	P	`	p	Ç	É	á	!	.	J	α	≡
1			!	1	A	Q	a	q	ü	æ	í	"	2	L	ß	±
2			"	2	B	R	b	r	é	Æ	ó	#	0	H	Γ	≥
3			#	3	C	S	c	s	â	ô	ú	*	/	F	π	≤
4		DC4	$	4	D	T	d	t	ä	ö	ñ	1	)	B	Σ	⌠
5			%	5	E	U	e	u	à	ò	Ñ	I	3	?	σ	⌡
6			&	6	F	V	f	v	å	û	ª	M	G	C	µ	÷
7			'	7	G	W	g	w	ç	ù	º	D	K	0	τ	≈
8			(	8	H	X	h	x	ê	ÿ	¿	@	9	P	Φ	°
9		CAN	)	9	I	Y	i	y	ë	Ö	⌐	<	6	-	Θ	·
A	LF		*	:	J	Z	j	z	è	Ü	¬	5	=	+	Ω	·
B		ESC	+	;	K	[	k	{	ï	¢	½	7	;	$	δ	√
C	FF		,	<	L	\	l	|	î	£	¼	8	:	(	∞	6
D	CR		-	=	M	]	m	}	ì	¥	¡	E	4	%	ϕ	²
E	S0		.	>	N	^	n	~	Ä	▪	«	A	>	'	ϵ	#
F			/	?	O	_	o	SP	Å	ƒ	»	,	N	&	∩	SP

CHARACTER SET

SP indicates a space character. Blank locations indicate unused codes.

	n	35_D 23_H	36_D 24_H	64_D 40_H	91_D $5B_H$	92_D $5C_H$	93_D $5D_H$	94_D $5E_H$	96_D 60_H	123_D $7B_H$	124_D $7C_H$	125_D $7D_H$	126_D $7E_H$
U.S.A.	0	#	$	@	[	\	]	^	`	{	|	}	~
FRANCE	1	#	$	à	°	ç	§	^	`	é	ù	è	"
GERMANY	2	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
U.K.	3	£	$	@	[	\	]	^	`	{	|	}	~
DENMARK I	4	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
SWEDEN	5	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
ITALY	6	#	$	@	°	\	é	^	ù	à	ò	è	i
SPAIN	7	₧	$	@	¡	Ñ	¿	^	`	"	ñ	}	~
JAPAN	8	#	$	@	[	¥	]	^	`	{	|	}	~
NORWAY	9	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
DENMARK II	10	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü

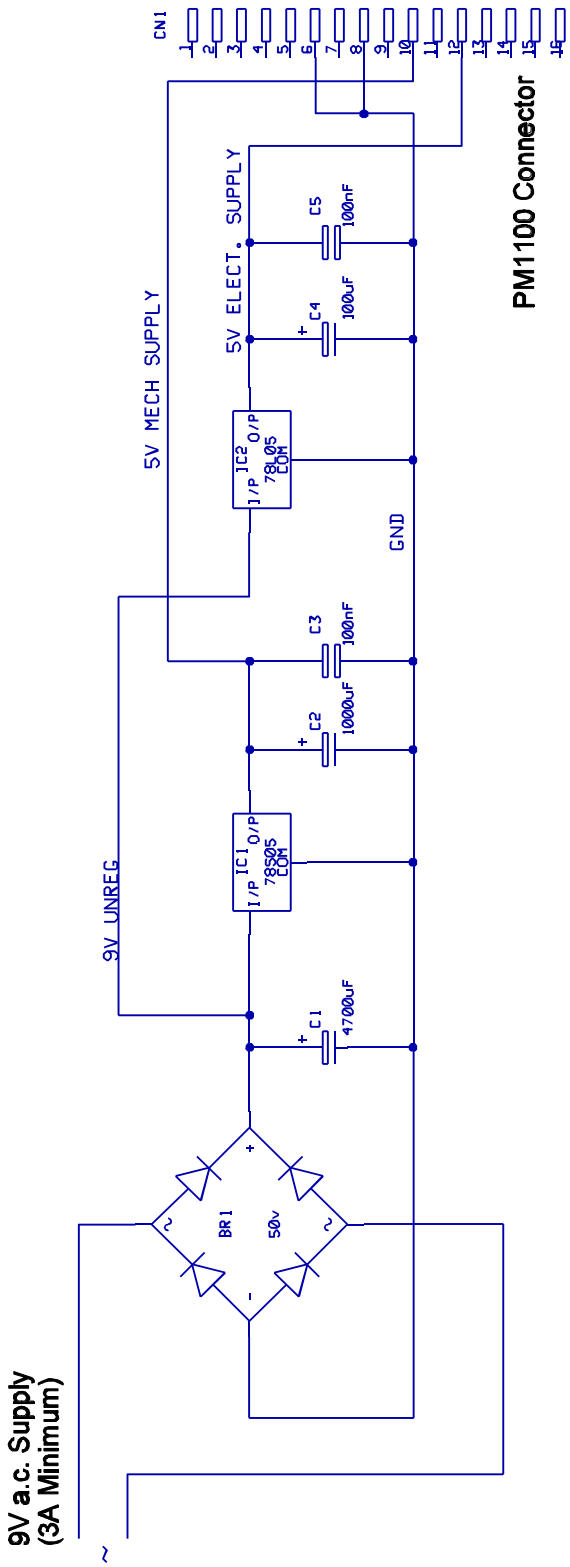
INTERNATIONAL CHARACTER SETS

APPENDIX C

Suggested Power Supply Circuit

SUGGESTED POWER SUPPLY CIRCUIT

The circuit shown below is suitable for powering the PM1100 family of printers



APPENDIX D

Specifications and Features

SPECIFICATIONS / FEATURES

PM1100

Power Supply	:	A supply of 5V d.c. at 3A(mean), 6A(peak) is sufficient to power the printer. On load terminal voltage must be limited to 5V ±5%.
Mechanism	:	EPSON M160/180/190 impact printer series.
Character Set	:	Full international character sets plus additional European and scientific characters. (See Appendix B).
Character Matrix	:	5 X 7 dots.
Buffer	:	1 character line.
Graphics	:	Refer to mechanism specifications.
Line Pitch	:	" " " "
Print Speed	:	" " " "
Reliability	:	" " " "
Interface	:	Centronics Parallel or RS232/TTL Serial.
Consumables	:	Ribbon Cassette : IRC160PU Paper : OP58
Environment	:	Operating Temperature 0 to 40 deg C. Storage Temperature -25 to 40 deg C. Operating Humidity 10% to 85% (Non-Condensing). Storage Humidity 10% to 90% RH (Non-Condensing).
Dimensions	:	109(±0.5)x mm x 62.0 (±0.5) mm

Ribbon

Standard Purple ink (250,000 characters) IRC160PU
Standard Black ink (200,000 characters) IRC160BK
Long Life Purple ink (1,000,000 characters) IRC180PU

Paper

The PM1100 uses wood free white paper to the following specification.

Dimensions	:	57.5mm ± 0.5mm (width) 57mm max (Roll diameter)
Thickness	:	85 microns

APPENDIX E

TROUBLESHOOTING AND MAINTENANCE

TROUBLESHOOTING AND MAINTENANCE

Troubleshooting

The majority of problems associated with PM1100's can be traced to improper installation, cabling or setup. The following notes should assist in identifying and correcting some of the more common problems. If additional assistance is required please contact your supplier.

(1) The power light does not come on when the unit is switched on.

Check that the power applied to the unit is correct. If power resource is satisfactory and the LED still does not illuminate when the power is switched on, refer the unit for repair.

(2) Power light comes on but does not feed paper.

This is a head jam condition. Check that there is no paper jammed in the mechanism.

(3) Power light comes on but flickers when printing or feeding paper.

Check rating of power source. (see page 6).

(4) Printer only prints rows of dots

Check rating of power source. (see page 6).

(5) Printer prints short lines of text but will not print full lines.

Check rating of power source. (see page 6).

(6) The paper is not feeding properly.

If the print looks squashed, check that the paper roll is sitting correctly in the paper well and that the roll is the right way up. The paper should be feeding off the bottom of the roll into the back of the mechanism. NOT off the top of the roll. Remove paper and reload if necessary.

(7) No print on paper.

If the printer is working but no print is visible, check that the ribbon is present and not excessively worn and that it is freely moving round the cartridge. Wind the ribbon on manually then feed paper while the lid is open to check the cassette knob is rotating. Also check that the ribbon has been fitted correctly and that the exposed ribbon is in front of the paper.

(8) Printer does self-test but does not print data sent through interface.

Check interface connections are correct.

(9) The printer prints ✱ in place of the transmitted characters or it does not action commands.

This indicates a communications error between host and printer. Check handshaking line or parity setting.

(10) If a command is not carried out by the printer, it is possible to check for an incorrect control code or character by initiating diagnostic Mode.

EXAMPLE : HORIZONTAL TAB (09H) = CTRL I Printed as I
CARRIAGE RETURN (0DH) = CTRL M Printed as M

Normal characters are not underlined.

Maintenance

Periodic cleaning will help to keep your printer in good condition.

IMPORTANT : Switch the power to the printer off and disconnect the power supply before any cleaning operation.

Use a soft brush to remove any dust or foreign particles from the paper well and mechanism. The case may be cleaned with a soft cloth lightly dampened with alcohol. Be careful not to let any liquid enter the printer enclosure.

Do not use the printer if liquid or metal objects have entered the unit. If this happens whilst the printer is in use, switch off immediately and have it serviced.

If the printer is not going to be used for some time disconnect the power adaptor and ensure the unit is switched off.

Do not continue printing with a worn ribbon, since this will eventually fray and may damage the print head.

Do not leave the printer powered up if it is malfunctioning.